

REMARKS

The present amendment is submitted in response to the non-Final Office Action mailed January 1, 2007. Claims 1-9, 11, 14, 17-26 are currently pending in the application. Claims 10, 12-13 and 15-16 have been cancelled without prejudice. Claims 17-26 have been added. No new matter or issues are believed to be introduced by this amendment. In view of the amendments above and the remarks to follow, reconsideration and allowance of this application are respectfully requested.

Claim Objections

Claims 12, 14 and 16 are objected to as being of improper dependent form for failing to further limit the subject matter of a previous claim. Claims 12 and 14 have been amended in a manner which is believed to overcome the objection. Claim 16 has been cancelled without prejudice. In particular, Claim 12 is re-written as Independent Claim 24, incorporating the limitations of Claim 1, as amended.

35 U.S.C. §102(b)

Claims 1-10, 12, and 15 were rejected under 35 U.S.C. §102(b) as being anticipated by WO98/11492 - Wolfgang.

Applicants respectfully traverse the rejection of claims 1-10, 12, and 15 under 35 U.S.C. §102(b), however, Claim 1 has been amended, Claims 10 and 15 have been cancelled without prejudice and Claim 12 has been re-written as New Claim 24. It is respectfully submitted that claims 1-9 and 24 are patentable over Wolfgang for at least the following reasons. Independent Claim 1 has been amended to better define Applicant's invention and to overcome the cited rejection.

Claim 1 now recites:

1. A method of embedding a signature in an audio-visual signal for authentication of said audio-visual signal, said signal being comprised of a plurality of sequential frames, the method comprising the steps of:

storing a first portion of a frame of said audio-visual signal, thereby allowing for a reduced memory requirement relative to storing an entire frame of said audio-visual signal,

calculating a signature based on the stored first portion of said frame of said audio-visual signal,

embedding the signature in one of said first portion and/or at least a second portion of said frame of said audio-visual signal.

As shown above, Claim 1 as amended now recites an audio-visual signal for which a signature may be calculated allowing for a reduced memory requirement (i.e., by storing only a first portion of the frame). The Claim further recites that the calculated signature may be embedded in either the first and/or second portions of the frame. It should be appreciated that a key advantage

provided by the invention is the ability to calculate the signature bits and embed a signature in the audio-visual signal in a way that completely obviates the need to buffer an entire frame of the audio-visual signal in a large memory, as is presently required in the prior art. In other words, the steps of calculating and embedding are performed, requiring only the first stored portion of the frame, thus, allowing for a reduced memory requirement.

In contrast to the present invention, Wolfgang is not directed to a technique for embedding a signature in an audio-visual signal to create a watermark with a reduced memory requirement. Rather, Wolfgang is directed to a watermark based authentication technique which embeds a watermark that is essentially random. An essentially random watermark is believed to make it infeasible to decipher or remove the watermark without degradation of the information that is watermarked, thus providing robust protection for owners.

Wolfgang teaches that a watermarked original signal is created by incorporating a supplied watermark onto an original signal. At least one first watermark indicator is generated based on the watermarked original signal and at least one second watermark indicator is generated based on a suspect signal and the watermark. A determination is made regarding whether the suspect signal is derived from the watermarked original signal based on the at least one first and second watermark indicators.

The Examiner cites Wolfgang at page 8, lines 21-30, as reading on at least Claim 1, where it is disclosed that a visually imperceptible watermark can be

generated by a checksum technique, where the watermark is a function of the pixel values of the original image 52, and the checksum watermark is then incorporated onto the least significant bit (LSB) plane of the image. In support of Applicant's assertion that Wolfgang is not directed to a technique for embedding a signature in an audio-visual signal to create a watermark with a reduced memory requirement, Wolfgang explicitly teaches at page 8 that – any watermarking algorithm 54, conventional or otherwise, may be used for providing and incorporating watermark 50 onto original image 52 to create a watermarked original image 56. The technique of Wolfgang includes analyzing first and a second watermark indicators, which are derived from the watermarked original signal and a suspect signal, from which a determination may be made regarding whether the suspect signal is derived from the watermarked signal. The determination being made solely on the basis of the first and second indicators. It is respectfully submitted that Wolfgang is silent with regard to optimizing memory in the creation of the watermark (i.e., any algorithm may be used).

Further, Claim 1 recites a sub-division of the frame into first and second portions for achieving the primary objective of the invention, namely, the calculation of a watermark having a reduced memory requirement. Wolfgang does not teach or disclose the step of sub-dividing a frame into constituent parts. At best, Wolfgang refers to a watermark being a function of pixel values.

It is therefore respectfully submitted that at least the limitations and/or features of Claim 1, as amended, is not anticipated by the disclosure of Wolfgang.

Accordingly, withdrawal of the rejection under 35 U.S.C. §102(b) with respect to Claim 1 and allowance thereof is respectfully requested.

Claims 2-9 depend from independent Claim 1 and therefore contain the limitations of Claim 1 and are believed to be in condition for allowance for at least the same reasons given for Claim 1 above. Accordingly, withdrawal of the rejection under 35 U.S.C. §102(b) and allowance of Claims 2-9 is respectfully requested.

Independent Claim 12 is re-written as Independent Claim 22, and recites similar subject matter as Claim 1 and therefore contains the limitations of Claim 1. Hence, for at least the same reasons given for Claim 1, Claim 24 is believed to be allowable over Wolfgang. Accordingly, withdrawal of the rejection under 35 U.S.C. §102(b) and allowance of Claim 24 is respectfully requested.

35 U.S.C. §103(a)

In the Office Action, Claim 11 was rejected under 35 U.S.C. §103(a) as being unpatentable over Wolfgang in view of U.S. Patent No. 5,809,139 – Girod.

Claim 11 depends from Claim 1 and therefore includes the limitations of Claim 1, as amended. Accordingly, for the same reasons given above for Claim 1, Claim 11 is believed to contain patentable subject matter. Accordingly, withdrawal of the rejections with respect to Claim 11 is respectfully requested.

35 U.S.C. §103(a)

In the Office Action, Claim 16 was rejected under 35 U.S.C. §103(a) as being unpatentable over Wolfgang.

Claim 16 has been cancelled and re-written as dependent Claims 17 and 18 which depends from Claim 1, as amended, and therefore includes the limitations of Claim 1. Accordingly, for the same reasons given above for Claim 1, Claims 17 and 18 are believed to contain patentable subject matter. Accordingly, withdrawal of the rejections with respect to Claims 17 and 18 is respectfully requested.

Conclusion

In view of the foregoing amendments and remarks, it is respectfully submitted that all claims presently pending in the application, namely, Claims 1-9, 11, 14, 17-25 are believed to be in condition for allowance and patentably distinguishable over the art of record.

If the Examiner should have any questions concerning this communication or feels that an interview would be helpful, the Examiner is requested to call Mr. Paul Im, Intellectual Property Counsel, Philips Electronics North America, at 914-333-9627.

Respectfully submitted,



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